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Claims:

1. A magnetically shielded container (1) having disposed in parallel opposed position on an axis (S) thereof magnetic field homogenizing pole shoes (10.1, 10.2), having disposed about said pole shoes a magnetically shielding yoke (2), said pole shoes and yoke enclosing a magnetic chamber (26), said container further comprising magnetic field sources (2.4, 2.5) disposed about and radially distanced from said axis whereby there exists within said chamber substantially homogeneous magnetic field B_0 oriented in the direction of said axis and whereby there is a usable volume within said chamber where the ratio of the magnetic field gradient in the direction transverse to said axis to said magnetic field B_0 has a value of no more than $1.5 \times 10^{-3}/\text{cm}$.

2. A container as claimed in claim 1 wherein said ratio has a value of no more than $7 \times 10^{-4}/\text{cm}$.

claim 1
3. (Amended) A container as claimed in ~~either of claims 1 and 2~~ wherein the ratio [of the volume] of said usable volume to the volume of said chamber (26) is greater than 1:30.

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Claim 1

4. (Amended) A container as claimed in ~~either of claims 1 and 2~~ wherein the ratio [of the volume] of said usable volume to the volume of said chamber (26) is greater than 1:2.

Claim 1

5. (Amended) A container as claimed in ~~either of claims 1 and 2~~ wherein the ratio [of the volume] of said usable volume to the volume of said chamber (26) is greater than 1:2.

Claim 1

6. (Amended) A container as claimed in ~~any one of the claims 1 to 5~~ wherein [the volume of] said usable volume is at least 50 [mL] ml.

Claim 1

7. (Amended) A container as claimed in ~~any one of claims 1 to 5~~ wherein [the volume of] said usable volume is at least 100 [mL] ml.

Claim 1

8. (Amended) A container as claimed in ~~any one of claims 1 to 5~~ wherein [the volume of] said usable volume is at least 200 to 2000 [mL] ml.

Claim 1

9. A container as claimed in ~~any one of claims 1 to 8~~ wherein said pole shoes (10.1, 10.2) are of μ -metal or soft iron.

Claim 1

10. A container as claimed in ~~any one of claims 1 to 9~~ wherein said yoke (2) is of a material which is not magnetically saturatable at magnetic field strengths below 1 Tesla.

Claim 1

11. A container as claimed in ~~any one of claims 1 to 9~~ wherein said yoke (2) is of a material which is not magnetically saturatable at magnetic field strengths below 2 Tesla.

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Claim 1

12. A container as claimed in ~~any one of claims 1 to 11~~ wherein said magnetic field sources (2.5) are disposed around the peripheries of each of said pole shoes (10.1, 10.2).

13. (Amended) A container as claimed in claim [11] 12 wherein said magnetic field sources are disposed between the side wall (2.2) and end walls (2.1.1, 2.1.2) of said yoke.

Claim 1

14. A container as claimed in ~~any one of claims 1 to 11~~ wherein said magnetic field sources (2.4) are disposed about said axis (S) on a plane (4) between said pole shoes (10.1, 10.2)

15. A container as claimed in claim 14 wherein said magnetic field sources (2.4) are disposed between two sections (2.3) of said yoke (2).

Claim 1

16. A container as claimed in ~~any one of claims 1 to 11~~ wherein one array of magnetic field sources (2.5) is disposed around the peripheries of each of said pole shoes (10.1, 10.2) and a further array of magnetic field sources (2.5) is disposed about said axis (S) on a plane (4) between said pole shoes (10.1, 10.2).

17. A container as claimed in claim 16 wherein said arrays (2.4, 2.5) of magnetic field sources are disposed as defined in claims 12 and 14.

Claim 1

18. A container as claimed in ~~any one of claims 1 to 17~~ further comprising a magnetic screen (40) disposed about said axis (S) within said yoke (2).

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~~Claim 1~~

19. A container as claimed in ~~any one of claims 1 to 18~~ further comprising at least one shim disposed about said axis (S) within said yoke (2).

~~Claim 1~~

20. (Amended) A container as claimed in ~~any one of the preceding claims~~ for which the ratio between the total weight of the container (1) and the volume of the magnetic chamber (26) is no more than 1 [kg/L] kg/l.

~~Claim 1~~

21. (Amended) A container as claimed in ~~any one of the preceding claims~~ for which the ratio between the total weight of the container (1) and the volume of the magnetic chamber (26) is no more than 0.2 [kg/L] kg/l.

~~Claim 1~~

22. (Amended) A container as claimed in ~~any one of the preceding claims~~ for which the ratio between the total weight of the container (1) and the volume of the magnetic chamber (26) is no more than 1/30 [kg/L] kg/l.

~~Claim 1~~

23. A container as claimed in ~~any one of the preceding claims~~ which is openable and sealingly closable.

~~Claim 1~~

24. A container as claimed in ~~any one of the preceding claims~~ wherein said pole shoes (10.1,10.2) are circular and said yoke (2) is substantially cylindrical.

~~Claim 1~~

25. A container as claimed in ~~any one of the preceding claims~~ wherein said pole shoes (10.1,10.2) are supported by magnetically resistant elements (16).

26. A container as claimed in claim 25 wherein said elements (16) are of rigid porous plastic.

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Claim 1

27. A container as claimed in ~~any one of the preceding claims~~ further comprising a gas storage cell (20) disposed in said usable volume in said magnetic chamber (26).

28. A container as claimed in claim 27 wherein at least the inner walls of said cell are formed of a material essentially free of paramagnetic substances.

29. A container as claimed in claim 28 wherein said material is a very low iron concentration glass.

30. A container as claimed in claim 29 wherein said glass has an iron concentration of less than 20 ppm.

Claim 27

31. A container as claimed in ~~any one of claims 27 to 30~~ wherein the walls of said cell (20) are uncoated.

Claim 27

32. A container as claimed in ~~any one of claims 27 to 31~~ wherein the wall of said storage cell (20) is of a low iron content glass, the iron content being sufficiently low that the ratio between the wall-related depolarization relaxation time T_1^w for nuclear spin polarized ^3He and the volume-to-inner surface area of said cell is at least 10 hours/cm.

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Claim 27

33. A container as claimed in ~~any one of claims 27 to 32~~ wherein said cell (20) is provided with a valve (22) to permit introduction and removal of gas.

Claim 27

34. A container as claimed in ~~any one of claims 27 to 33~~ wherein said cell (20) contains nuclear spin polarized gas.

35. A container as claimed in claim 34 wherein said gas is ^3He or ^{129}Xe or contains ^{19}F , ^{13}C or ^{31}P .

Claim 27

36. (Amended) A container as claimed in ~~any one of claims 27 to 35~~ wherein said cell (20) has an internal volume of at least 50 [mL] ml.

Claim 27

37. (Amended) A container as claimed in ~~any one of the claims 27 to 35~~ wherein said cell (20) has an internal volume of [between] between 100 [mL] ml and 1 [m³] l.

Claim 1

38. A container as claimed in ~~any one of the preceding claims~~ in transportable form.

Claim 1

39. A container as claimed in ~~any one of the preceding claims~~ further comprising a magnetic field sensor (32) disposed within said magnetic chamber (26).

40. A container as claimed in claim 39 further comprising means for moving said sensor (32) relative to a gas storage cell (20) disposed in said magnetic chamber (26).

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41. A container as claimed in claim 39 further comprising a source (30) for a time variant magnetic field disposed in said magnetic chamber (26).

Claim 1

42. A container as claimed in ~~any one of the preceding claims~~ further comprising a spacer (12,205) so disposed as to maintain said pole shoes (10.1,10.2) in parallel opposed relationship.

Claim 1

43. A container as claimed in ~~any one of the preceding claims~~ having a double-hulled (200.1,200.2) construction whereby said yoke (2) is provided at least in part by the inner hull (200.2).

Claim 1

44. A container as claimed in ~~any one of the preceding claims~~ in the form of a magnetic device (1) with an internal space which provides a high-volume, largely homogeneous, shielded magnetic field within its interior, whereby the magnetic device (1) features homogenising μ -metal plates as pole shoes (10.1, 10.2), wherein a ratio of 1:1.5 can be achieved between the useable volume of the magnetic device within which a homogeneous magnetic field is present and the overall volume of the magnetic device and the homogeneity condition

$$G_r \leq 1.5 \times 10^{-3}/\text{cm}$$

is fulfilled within the useable volume, whereby G_r is the relative transverse magnetic field gradient.

45 - 47 (cancelled by Examiner's Amendment)